

## 500 STRUCTURES

### ITEM 516 - EXPANSION AND CONTRACTION JOINTS, JOINT SEALERS AND BEARING DEVICES

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**516.01 Description.** This item shall include the furnishing of all materials and the necessary labor to fabricate, assemble, construct, paint, coat, and install expansion and contraction joints, vertical extension of structural steel expansion joints, strip seals or bearing devices of the type, size and kind specified. All work shall be governed by the item of these specifications that applies to that particular kind of work. The fabrication and painting of joints and bearing devices shall conform to Items 513 and 514 respectively.

**516.02 Materials.** Materials shall conform to the following:

Structural steel.....	513
Bearing bolts and anchor rods .....	513.16
Painting. ....	514
Steel castings. ....	711.07
Sheet copper.....	711.15
Bronze.....	711.16 711.17, 711.18
Sheet lead. ....	711.19
Preformed bearing pads.....	711.21
Elastomeric bearings. ....	711.23
Preformed fillers .....	705.03
Joint sealer, hot applied.....	705.04
Preformed elastomeric compression joint seal for concrete .....	705.11

Mill test reports for structural steel, steel castings, bronze and sheet lead shall be submitted according to Section 501.07.

**516.03 Expansion and Contraction Joints.** Open expansion joints shall be completely open for the dimension specified for their full length. Care shall be taken to remove all stones, forms or other material that would in any way interfere with expansion.

The surface against which preformed expansion joints are to be placed shall be finished to a smooth, uniform surface. The expansion joint materials shall be adequately anchored, but methods of fastening that interfere with the free compression of the joint material shall not be used. The joint material shall neatly fill the space, and have a uniform thickness for the full extent of the joint.

Preformed joints between sliding surfaces shall consist of two thicknesses of joint material, laid without surface irregularities and with joints in the layers staggered.

Folded metal joints shall be watertight, and so placed that the fold will be free from kinks. The splices shall be riveted and soldered. At bends the strip shall be preferably one piece.

**516.04 Joint Sealers.** The surface to which joint sealer is applied shall be prepared as follows: concrete shall be cleaned of all foreign matter, curing compounds, oil, grease, dirt, free water and laitance; steel shall be thoroughly cleaned by sand blasting.

The joint sealer shall have a minimum depth of 1 inch (25 mm) at its thinnest section. Joints shall be filled to within 1/4 inch (6.4 mm) of the roadway surface.

No joint sealer shall be placed in contact with any bituminous material, but shall be separated from it by a barrier of foil or other material that is impervious to bitumen.

Where it is required to prevent bonding of the joint sealer with a joint surface, a suitable bond breaker barrier shall be placed, at no extra cost, before applying the joint sealer.

Any joint sealer that is intended to be bonded but is not bonded to the joint face 24 hours after placing, shall be removed and the joint shall be thoroughly cleaned by sand blasting and resealed at the Contractor's expense.

The mixing and placing instructions of the manufacturer shall be adhered to. A copy of these specifications for the application shall be filed with the Engineer.

Joints which will be subjected to concrete protective coatings containing mineral spirits shall have the sealer protected by an impervious masking tape during the application of the protective coating.

**516.05 Bearing Devices.** For sliding plates the sliding surfaces shall be lubricated with flake graphite and one shall be superimposed on the other with their edges flush.

Concrete surfaces on which sheet asbestos packing is to be placed shall be finished smooth with a metallic trowel.

Elastomeric bearings, bearing plates and bolsters shall be accurately set as to level and alignment. Bearing slates and bolsters shall be bedded on sheet lead 1/8 inch (3.2

mm) thick, meeting the requirements of Section 711.19, or preformed bearing pads 1/8 inch (3.2 mm) thick, meeting the requirements of Section 711.21.

Elastomeric bearing pads shall be set directly on the concrete surface.

Bearing plates or bolsters shall be placed upon bridge seat areas which are plane and smoothly finished. If the bridge seat area is high or uneven, proper elevation and a level surface shall be secured by bushhammering or grinding the area and then smoothing with a thin film of Portland cement mortar or paste to fill the pitted surface. If the bridge seat area is low, the proper elevation shall be secured by the use of steel plate shims of the same bearing area as the bearing plates and bolsters.

Rockers or rollers shall be so placed that when the bridge is completed and at 60° F (16° C) the rockers will stand in a vertical position and the rollers will center on the base.

Anchor bolts that are clear of the beam or girder flanges shall be set in the concrete after the erection of the main structural steel, except as hereafter specified for bearing devices at abutments. When structural steel will interfere with the setting of the anchor bolts, they shall be permanently fastened to the abutments, steel beams or girders before the steel is erected by the use of a template for support and embedded in the concrete when it is placed, or by drilling or forming the holes. Bearing devices at abutments shall not be set until the abutments have been backfilled to within one foot (0.3 m) of the top of the bridge seat. Reinforcing steel in the bridge seat shall be placed so that it will not interfere with the drilling of anchor bolt holes. Anchor bolts shall be accurately set in the holes and bedded in cement mortar. Care shall be used to prevent the entrance and freezing of water in anchor bolt holes.

Swedge anchor bolts or bars shall be fabricated by deforming a minimum of 20 percent of the embedded bolt surface with deformations whose radial dimensions are 15 to 20 percent of the bar diameter.

**516.06 Method of Measurement.** The quantity shall be the actual number, linear feet (meter), square feet (square meter), or pounds (kilogram). The quantity for structural steel expansion joints extended vertically, for the purpose of deck resurfacing, shall be the actual horizontal length of joint.

**516.07 Basis of Payment.** Payment will be made at the contract price for:

<b>Item</b>	<b>Unit</b>	<b>Description</b>
516	Linear Foot (Meter), Pound (Kilogram)	Structural Steel Expansion Joints
516	Linear Foot (Meter)	Structural Expansion Joints Including Elastomeric ____ Seals
516	Linear Foot (Meter)	Elastomeric Compression Seals for Structural Steel Joints, ____ Width
516	Linear Foot (Meter)	Folded Copper Strip ____

516	Linear Foot (Meter)	Vertical Extension of Structural Steel Expansion Joints
516	Linear Foot (Meter)	Vertical Extension of Structural Steel Expansion Joints Including Elastomeric ___ Seal
516	Square Foot (Square Meter)	___" (mm) Preformed Expansion Joint Filler
516	Linear Foot (Meter)	Joint Sealer
516	Each, Linear Foot (Meter)	Bearing Devices
516	Square Foot, (Square Meter)	Pound (Kilogram)
516	Each	___x___x___Elastomeric Bearings
516	Each	___x___x___ Laminated Elastomeric Bearings
516	Square Foot (Square Meter)	1/8" 3.2 mm) Preformed Bearing Pads